



Local dishes are disappearing from eating habits in the Baatonou cultural area in northwest Benin

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ABSTRACT

The human diet has been undergoing perpetual change for several years due to a variety of factors. These changes have led to the gradual disappearance of certain local dishes and eating habits. Our study aims to contribute to the promotion of local dishes that have disappeared or are in danger of disappearing in Benin. The study took place during the first half of 2022. The nonprobability-purposive sampling technique was used to determine the sample size. The target groups were heads of household, kings, family community leaders, and guardians of ancestral traditions. Data were collected in the field using Kobotools box software. A total of 22 people with an average age of 62 ± 12 took part in the study. The number of local dishes identified was 32, 94% of which were of plant origin. 6% were cited as "food prohibitions" exclusively for people aged 60 and over. Recurring theoretical reasons for the disappearance of these dishes include a lack of knowledge of the benefits of these foods (21.9%), global warming (15.6%), herbicide use (9.4%), and species extinction (9.4%). Significance tests also revealed a significant difference between the kingdom to which the endangered or extinct dishes belong, the recommended quantity ($p = 0.030$), and the undesirable effects in the event of excess ($p = 0.008$). A study focusing on the nutritional quality of these dishes would help reveal their place on consumers' tables to strengthen the resilience of the food-insecure populations of the aforementioned zone

Keywords: local dishes; eating habits; Baatonou cultural area; Benin

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INTRODUCTION

The dynamics of nutrition are constantly changing due to a combination of agronomic, economic, behavioral and zootechnical factors (**Henri, 1975; Dunoyer, 2021**). Industrialized countries such as Portugal and France have changed their eating habits much more over the last 50 years than in previous centuries (**Hercberg, 1996**). New foods have been introduced, while others have virtually disappeared from the composition of local meals. These far-reaching changes have both positive and negative nutritional and health aspects, with both advantages and disadvantages (**Hercberg et al., 2000**). In Europe, specifically in Hungary, the disappearance of certain local dishes based on mangalitza pork has been observed, despite the fact that it occupies a prominent place in the country's gastronomy (**Brightly, 2020**). In many developing countries, particularly in Sub-Saharan Africa, urbanization is adding a particular touch to diets, with a resurgence of exotic products that are increasingly popular and undermine local delicacies (**Wade and Lançon, 2015**). As an intangible cultural heritage value, local dishes are considered to be one of the important elements that contribute to the formation of a region's identity and reflect the culture of that region (**Duman and Avcikurt, 2023**). In Benin, several dishes are on the verge of extinction for one reason or another. This is the case for corn-based dishes such as Gbadé ounsounou and Klèklè (**Adjadi et al., 2015**). In Atacora, and particularly in the communes of Kouandé, Kérou and Péhunco (2KP), some dishes have completely disappeared, and others are on the verge of disappearing from the dietary habits of the said populations, such as Sambo, Yainou, Korornou, and Sauce based on Yakamon. However, paradoxically, analysis of the various simple foods making up these dishes reveals appreciable nutritional quality (**Konate et al., 2017, Kunindjani et al., 2020**). Similarly, there are very few studies devoted to disappearing or endangered foods in Benin. The few that have been carried out in Benin have addressed the theme of cereal (maize)-based dishes (**Adjadi et al., 2015**). Thus, we initiated this study intending to produce a broader directory of disappeared or endangered foods in the communes of 2 kp to propose strategies for the revalorization of foods with high nutritional potential. The general objective of this research is to enhance the value of local dishes that have disappeared or are in danger of disappearing in the communes of Kouandé, Kérou and Péhunco. The specific objectives are as follows- 1- List local dishes that have disappeared or are in danger of disappearing in the study areas. 2- Identify the factors determining their disappearance. 3- Propose strategies and actions for their recovery.

MATERIALS AND METHODS

The communes of 2KP are located in northwestern Benin. They are bordered to the north by the Alibori department and the commune of Toucountouna, to the south by the communes of Copargo and Djougou, to the east by the Borgou department and to the west by the communes of Natitingou and Toucountouna (**Afrique, 2006**). The study area comprises 13 arrondissements, including 6 in Kouandé, 4 in Kerou and 3 in Péhunco. The following map shows the data collection area (**Figure 1**).

DATA COLLECTION CARD

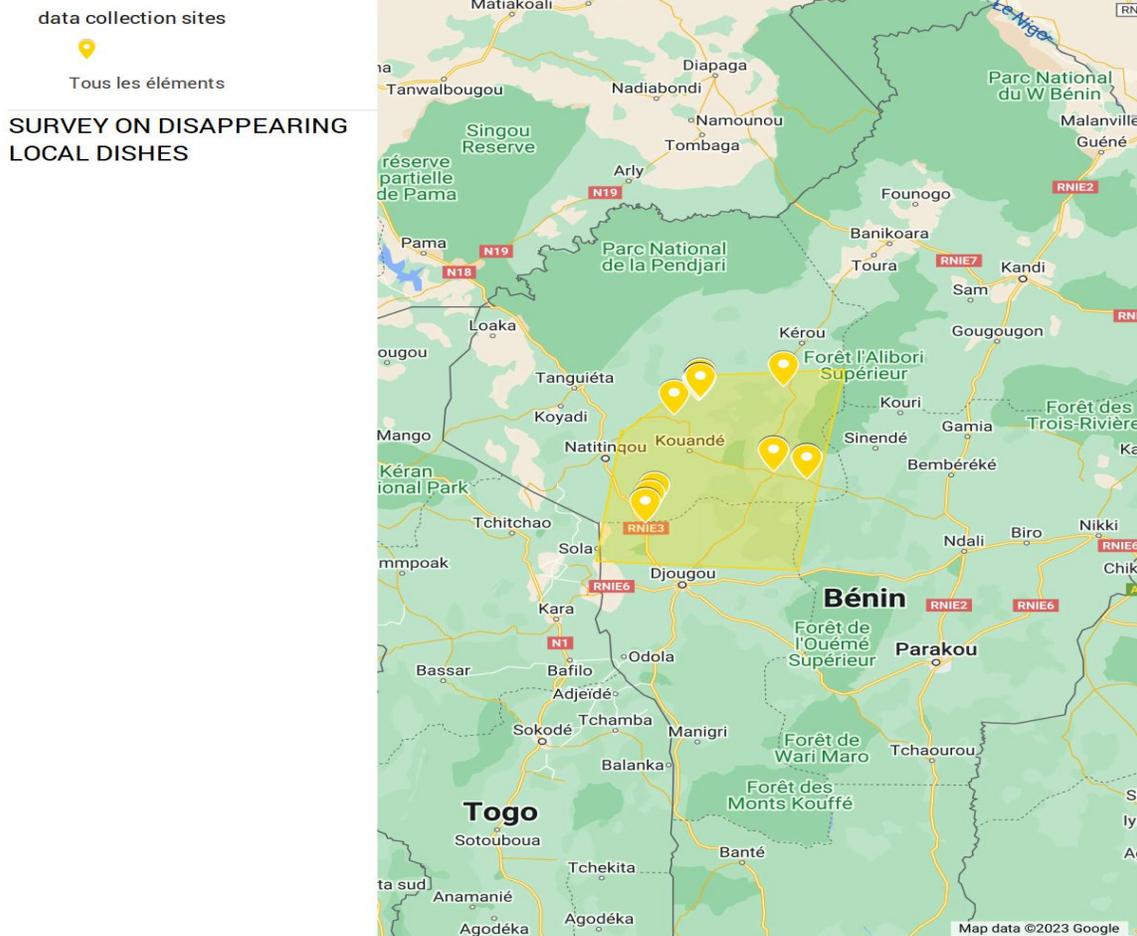


Figure. 1 Geolocation map of data collection locations

Type and period of study

This is a prospective, descriptive and analytical study. It took place from November 2022 to July 2023 in the municipalities of northern Benin.

Target population

The target population was made up of heads of household, heads of local authorities and kings of the municipalities of Kouandé, Kérou and Péhunco.

Inclusion criteria

- Men and women aged 26 and over with full mental faculties.
- Any individual belonging to the target population who agreed to participate in this study.
- Any member of the target population familiar with the realities of the study area.

Exclusion criteria

The following are excluded from this study:

- People under 26 years of age
- Foreigners not familiar with the realities of the area
- Participants who did not agree to complete the questionnaire
- People not in full possession of their mental faculties are also excluded.

Sampling method

A nonprobability-purposive sampling technique was used. The various target groups were heads of household meeting the inclusion criteria, kings, heads of family communities and guardians of ancestral traditions.

Sample:

This is made up of people who have agreed to take part in the research.

Collection techniques and tools

This is a cross-sectional, descriptive and analytical study. It is carried out through an interview using a digital questionnaire on smartphones via the Kobotools collection interface. Recruitment of 3 field agents, including 1 controller for the actual data collection. These agents are recruited based on their knowledge of the sociocultural realities of the target communes.

Ethical and administrative considerations

The free and informed consent of each respondent was obtained before any interview. Only participants who provided consent were interviewed. The confidentiality of responses is guaranteed. An information visit was made to the political and administrative authorities, and information sessions were held with the traditional authorities of the target communes before the start of data collection.

RESULTS AND DISCUSSION

I- Sociodemographic characteristics

The study of endangered foods carried out in Benin's Atacora department, specifically in the Baatonou cultural area (Kérou, Kouandé and Péhunco), involved 22 participants, the majority of whom were men. The average age was 62 ± 12 years. Half of the population surveyed was illiterate. Their social position varied between the household head (86.4%), community head (9.1%), and traditional chief (4.5%).

II- List of dishes that have disappeared or are in the process of disappearing

Table1 shows that 32 dishes are in danger of disappearing in this cultural area. Of these, 11 are sauces, 9 are dishes, 4 are porridges, 3 are fruits, 2 are meats and just 1 is (cheese, drink, and mineral).

Table 1: List of local dishes that have disappeared or are in the process of disappearing

Name baatonou	French name	Nature of the local dish	Nutritional quality/ spiritual power
Dɔsinu	Abobo to vulgaris Phaseolus	Bean dish	against disease
Sakakuko n kpe	Sakakoukor sauce	Sauce	against disease
Sāmbon dōnu	Foula of Sorghum bicolor	Porridge	against disease
Yāyinon kpe	Séné occidentalis Sauce	Sauce	against disease
Yāguniā	Gossypium hirsutum sauce	Sauce	against witchcraft
Garise	Cereal porridge with the pulp of parkia biglobosa	Porridge	Highly nutritious
Sōkin gasaru	Sesamum indicum cheese	Cheese	It is rich in vitamin
Yēn soru	Dried crushed Dioscorea porridge	Porridge	Highly nutritious
Bām	Elaeis guineensis wine	Drink	For doping
Koobuyōku	Creeping, fragrant plant sauce	Sauce	against witchcraft
Wiyāru	Cucurbita pepo var. fastigata ragout	Ragout dish	Highly nutritious
Beseru	Wild fruit	Fruit	against disease
Gbe suni	Sorghum bicolor white	Boiled white sorghum dish	against disease
Gēm	African potash	Mineral	against disease
Gunō sadu	Giant rat	Rat meat	against disease
Gauu	Allium cepa leaf sauce	Sauce	Allows you to keep a child permanently at home after giving a bath. Crush and give to the child to drink to soothe tummy aches.
Yakamō	Andropogon tectorum sauce	Sauce	against witchcraft against disease
Sōku kakuru	Dioscorea crushed recycled	Crushed yam dish	Highly nutritious
Yikunu	Mixture of boiled cereals	Boiled cereal mix dish	No
Kōronu	Decomposing Hibiscus sabdariffa Seed Sauce	Sauce	against witchcraft against disease
Bārun soru	Borassus aethiopum-based ball	Porridge	Highly nutritious
Yoronu	Berry fruit	Fruit	against disease
Gbeheru	Cucurbita pepo L sauce	White Courgette Sauce	against disease
Kpeewaa	Zucchini sauce	Zucchini sauce	against disease
dōn wurusu sōkuru	Dioscorea boiled from Parkia biglobosa leaves	Crushed yam dish	against disease
Ya kōsu	Decomposing game meat	Meat	against disease
Kurō kun tōnu	Leaf vegetable sauce	Leaf vegetable sauce	No
Yēnu	Dried mashed yam cucumbers	Couscous dish of mashed yam	Corrects poor digestion
Sāmbō	Sorghum bicolor pellet	Sorghum dumpling dish	Highly nutritious
Gbarekiaru	Zea mays cake	Corn cake dish	Highly nutritious
Yakeru	Wild fruit	Fruit	Facilitates digestion
Suunu kōdu	Vigna unguiculata sauce	Sauce	Facilitates digestion

III/Characterization of dishes

Table 2: Kingdom, preparation method, type of consumer, and season

	Frequency	Percentage
Kingdom		
Plants	30	94%
Animal	2	6%
Preparation method		
Prepared	27	84%
Cru	5	16%
Type of consumer		
The whole world	30	94%
Seniors	2	6%
Peak season		
Rainy season	10	31%
Dry season	4	13%
Harmattan	10	31%
All seasons	8	25%

An analysis of the **table 2** reveals that -94% of these dishes are of vegetable origin-84% are eaten cooked-94% can be eaten by everyone A total of 25% of these foods are abundant in all seasons.

Table 3: Time of consumption, quantity, temperature and undesirable effects

	Frequency	Percentage
Time of consumption		
Any time	28	88%
Morning	2	6%
Afternoon	2	6%
Quantity		
Until satiation	22	69%
Moderate	10	31%
Consumption temperature		
Hot	11	34%
Cold	3	10%
Never mind	18	56%
Side effects		
None	24	75%
Constipation	2	6%
Disease	2	6%
Vomiting	1	3%
Diarrhea	2	6%
Stomach aches	1	3%

Table 3 shows the following:-12% of these foods have a specific time of consumption- 31% should be eaten in moderation-34% should be eaten hot and 10% cold-25% cause undesirable effects (vomiting, stomach ache, diarrhea, and constipation).

Table 4: Table showing the causes of disappearance of local and totem dishes

	Frequency	Percentage (%)
Reasons for disappearances		
Deforestation and the use of herbicides	1	3.1
Lack of awareness of its benefits	7	21.9
The disappearance of the species	3	9.4
Too restrictive	1	3.1
Existence of a varied range of dishes	1	3.1
Use of herbicides	3	9.4
Rational preparation of yam	1	3.1
Deforestation	1	3.1
Because of the difficulty of cultivation	1	3.1
Its increased use	1	3.1
I do not know	1	3.1
Global warming	5	15.6
Because of its smell	1	3.1
Lack of knowledge of its benefits and Global Warming	1	3.1
Lack of importance	1	3.1
Lack of will	1	3.1
Lack of taste	1	3.1
Lack of love	1	3.1
Totem		
Yes	1	3
No	31	97

Table 4 shows that there are several reasons for the disappearance of these foods. The main reasons are a lack of awareness of the benefits of these foods (21.9%), global warming (15.6%), the use of herbicides (9.4%) and the disappearance of the species (9.4%). In the same table, the majority of these foods have no totem (97%) for the consumer.

IV/Relationship between the kingdom to which the dish belongs and certain parameters

Table 5: Relationship between the kingdom to which the dish belongs and its recommended quantity

Cross tabulation		Reign			Total	P value
		Animal	Vegetal			0.030
Recommended quantity	Until satiation	0	22	22		
	Average	2	8	10		
Total		2	30	32		

Table 6: Relation between the reign to which dishes belong and undesirable effects

Cross tabulation		Reign		Total	P value
		Animal	Vegetal		
Adverse effects in case of excess	No side effects	1	23	24	0.008
	Constipation	0	2	2	
	Diseases	0	2	2	
	Vomiting	0	1	1	
	Diarrhea	0	2	2	
	Stomach aches	1	0	1	
Total		2	30	32	

Analysis of **Tables 5 and 6** revealed a significant difference between the kingdom to which the endangered or extinct foods belong and the recommended quantity ($p = 0.030$), with undesirable effects in the case of excess ($p = 0.008$).

Discussion

The study of endangered foods in the Baatonou cultural area of the Atacora department involved 22 participants, most of whom were illiterate. This result is contrary to that obtained by **Mahamadou et al., 2022** in Niger. This finding could be explained by the difference in the methodology used. The study carried out in Niger was based more on documentary research and interviews with academics and other educated people. This is not the case in the present study, which focused on the holders of endogenous knowledge, who are not necessarily all literate. Our results show that a total of 32 dishes have disappeared or are in the process of disappearing in the Baatonou cultural area of the Atacora department in northwestern Benin. This figure is considerably lower than that obtained by **Mahamadou et al., (2022)** in Niger, which found 518 food recipes. This large discrepancy could be explained by a number of factors, including the size of the study area, the type of study and even the time taken to collect the data. The study carried out by **Mahamadou and his colleagues** covered all of Niger, which is not the case here. Similarly, the study carried out in Niger had a broader objective, which was to establish all the food recipes, whether or not they had disappeared, their ingredients and the foods commonly consumed in households in Niger; this is not the case with our study, which focused exclusively on dishes that have disappeared or are in danger of disappearing. The results of our work show that almost all of the dishes identified are of plant origin. This rate is comparable to that found by **Mark et al., (2019)** who found that of all the foods commonly consumed by humans, only 5 out of 17 were of animal origin. This ratio in favor of plant-based foods is in line with recommendations for a healthy diet. Furthermore, very few dishes (6%) were cited as "forbidden foods" exclusively by people aged 60 and over. This finding is comparable to that of **Louise, (2023)** in Côte d'Ivoire. Her study showed that only a few foods, including sweet potato, tarot, catfish, banana, papaya, soya, millet, okra and peas, were cited as forbidden foods. The results of our work show that only a quarter (25%) of the dishes consumed in the Bariba cultural area were eaten in all seasons; otherwise, the majority were eaten in a specific way from one season to another. This result is in agreement with that

obtained by **Péhaut, (1960)**, who showed the great variability of the diet from the rainy season to the dry season. Similarly, our results highlighted the existence of dishes consumed exclusively at given times of day. This result is comparable to that obtained by **Utermohlen et al., (1993)**, who insist on the fact that the distribution of meals over time is an existing fact whose foundations are of various orders, including social and biological. Moreover, of the foods identified in this study, only 25% caused undesirable effects (vomiting, stomach upsets, diarrhea, and constipation) that were undoubtedly linked to allergens or the unsanitary nature of the food. This result is much lower than that obtained in France by the **Centre d'Investigations Cliniques et Biologiques en Allergologie Alimentaire (CICBAA)**, which estimates that approximately 50% of latex, Rosaceae, Umbelliferae, various nuts and peanuts have undesirable effects on adult consumers. With a view to understanding and listing the reasons behind the disappearance of the species that make up most of the endangered local dishes, the questionnaire revealed four main factors that condition this disappearance, including a lack of knowledge of the benefits of these foods (21.9%), global warming (15.6%), the use of herbicides (9.4%) and the disappearance of the species (9.4%). This result is in line with that of the **Convention on Biological Diversity (CBD, 2007)**. This booklet highlights the significant impact of global warming on the various species and clearly illustrates the disappearance of the golden toad. In addition, our results show the existence of totems among the foods that have disappeared or are in danger of disappearing in the Bariba cultural area, i.e., approximately 3%. This totem-related cause of disappearance in the Baatonou area is similar to that of **Henry, (2005)** on culinary preparations among the Fulani of Diamaré (Cameroon), who found that the Fulani respect Islamic dietary prohibitions such as domestic duck, fish without scales, etc. The search for a significant relationship between the disappearance of dishes and certain parameters shows the existence of a significant relationship for three factors: the kingdom to which the disappearing or disappearing dishes belong, the recommended quantity of the dish ($p = 0.030$) and the undesirable effects in the event of excess ($p = 0.008$). These results differ from those found by **Tente, (2005) and Afouda, (2006)** who indicate in their work that the main factors behind the disappearance of species are poor farming practices, rudimentary livestock systems and uncontrolled logging. In addition, our results show the existence of totems among the foods that have disappeared or are in danger of disappearing in the Bariba cultural area, i.e., approximately 3%. This totem-related cause of disappearance in the Baatonou area is similar to that of **Henry T., (2005)** on culinary preparations among the Fulani of Diamaré (Cameroon), who found that the Fulani respect Islamic dietary prohibitions such as domestic duck, fish without scales, etc. The search for a significant relationship between the disappearance of dishes and certain parameters shows the existence of a significant relationship for three factors: the kingdom to which the disappearing or disappearing dishes belong, the recommended quantity of the dish ($p = 0.030$) and the undesirable effects in the event of excess ($p = 0.008$). These results differ from those found by **Tente, (2005) and Afouda., (2006)**, who indicate in their work that the main factors behind the disappearance of species are poor farming practices, rudimentary livestock systems and uncontrolled logging.

CONCLUSION

The study undertaken in the Baatonou cultural area identified a fairly large number of local dishes that have disappeared or are in danger of disappearing. The study revealed a diversity of nutritional and spiritual qualities specific to these dishes. The factors involved in their disappearance are varied, and we can list the kingdom to which the disappearing or endangered local dishes belong, the recommended

quantity to be consumed and, finally, the undesirable effects in the event of excess. Given their excellent nutritional characteristics and highly beneficial spiritual powers, an in-depth study of the composition and technological diagrams of their preparations would help to make the most of these dishes.

List of abbreviations

2KP: Kouandé, Kérou and Péhunco

CICBAA: Centre for Clinical and Biological Investigations into Food Allergology

CBD: Convention on Biological Diversity

Declarations

Ethics and consent

Verbal consent was obtained from respondents through their oral agreement to participate or not after explaining the objectives of the study.

Availability of data and materials

The data were made public on the Zenodo website. They can be consulted using <https://doi.org/10.5281/zenodo.10137686>

Conflicts of interest

The authors declare that there are no conflicts of interest.

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Authors' contributions

All the authors contributed to this work.

BIO BOUKO Boni Orou Marius, KABANOUE Antoine, ADEBO Adégnika Amirath, and AMOGOUL Olaréwadjou participated in writing the research protocol, collecting and processing the data, and writing the final article. BEHANZIN Gbessohèlè Justin, YESSOUFOU Abdou Ganiou: supervised all the work.

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